



U.S. AIR FORCE

Headquarters U.S. Air Force

Air Force Sustainability Update



U.S. AIR FORCE

Integrity - Service - Excellence

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAY 2009		2. REPORT TYPE		3. DATES COVERED 00-00-2009 to 00-00-2009	
4. TITLE AND SUBTITLE Air Force Sustainability Update				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Headquarters U.S. Air Force, 1690 Air Force Pentagon, Washington, DC, 20330-1670				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 4-7 May 2009 in Denver, CO.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 34	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



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Overview

- **Air Force Accomplishments**
- **Challenges**
- **Incremental Steps**
- **Current Approach**
- **Enterprise Solution**
- **Sustainable Communities Rating System**
- **Leadership in Sustainable Communities**



Air Force Success Stories

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■ Nellis AFB PV System

- Largest PV array in N. America

■ EPA Green Power Partnership

- Top federal agency for renewable energy (5%)

■ AF MILCON Program

- AF Weather Agency – 1st LEED Gold in the AF
- Keesler Housing – Largest LEED community in US homes

■ Natural Resources

- Solid Waste Diversion (2007) - 62%
- HAZWASTE disposal reduction (1996-present) – 33%
- Toxic Release Inventory reduction (2001-2006) – 34%
- Ozone Depleting Substance elimination (1990-present) – 96%
- Water Reduction (FY01-FY07) – 32%
- Green Remediation Technologies (50% are „green“)



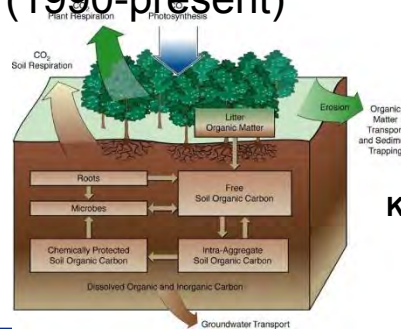
70,000 panels generate 25M KWh per year



AF Weather Agency – 1st LEED Gold



Keesler Housing (736 LEED Silver Homes)





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Challenges

- **Easy wins already accomplished**
- **Individual building approach problematic**
- **Conflicting regulatory requirements**
- **Funding stovepipes still exist**



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Incremental Steps Toward Sustainability

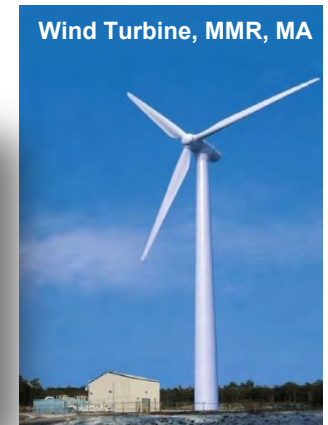
- Energy/Green Procurement
 - 100% participation in EnergyStar “Operation Change Out”
- Sustainable Design and Development Policy
- Natural Resources
 - Sustainable Range Operations
 - Engagement on encroachment
 - Range Residue Resource Recycling
 - AF Recycling Program
 - Alternative Fuels Initiative
- Green Remediation
 - Environmental Restoration Program Optimization (ERP-O)
 - Sustainable Remediation Tool



Wind Turbine, MMR, MA



Solar-powered in situ bioreactor, Travis AFB, CA





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Current Approach

- DoD existing building inventory: ~330,000
 - 15% HPSB by 2015: ~49,500 buildings
- Survey every building
 - 330,000 Buildings
 - Each building survey must incorporate approximately 30-90 data elements
 - Result: **9.9M-30M** data elements
- No single survey in place for all Federal requirements – conflict/duplication



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Enterprise Solution

- More holistic, comprehensive & synergistic methodology for sustainability
- Utilize an enterprise approach solution which
 - Integrates both the built and natural infrastructure
 - Incorporates sustainable principles in
 - Environmental Management System (EMS) and
 - Asset Management life-cycle planning
 - Facilitates continuous improvement
 - Enables enterprise acquisition
 - Institutionalizes sustainability cultural shift



“Sustainable Communities”





Sustainable Communities

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- **Tri-Service proposes a Fence-to-Fence rating system**
 - **LEED-like scorecard**
 - **10 categories with requirements & credits under each**
 - **„CreditSheets“ identify requirements and how to comply**
- **Based on Asset Management and EMS**
 - **Each „credit“ mapped to Activity Management Plan**
 - **Continuous improvement process**
- **Proposed Categories:**

Planning	Built Infrastructure
Energy & Greenhouse Gas Emissions	Transportation
Water Efficiency	Human Health, Development & Productivity
Materials & Waste Management	Community Engagement
Natural Infrastructure	Innovation & Regional

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Leadership in Sustainable Communities (LSC)

LSC incorporates the mission, social and environmental impact into the business model.



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Conclusion

- **Challenges are opportunities to create a paradigm shift**
 - **Incremental steps towards sustainability are suboptimal**
 - **Current approach to Federal Mandates – large data burden**
- **Enterprise Solution: *Sustainable Communities***
 - **Triple Bottom Line is incorporated into the structure of Sustainable Communities**
 - **Next Tri-Service Collaborative Group Sustainable Communities meeting 12 May 2009 – Wash DC**



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Related Briefings

- **Green Remediation: Wed, 6 May 2009**
 - 8259
 - 8050
 - 8046
- **Environmental Program Management: Wed, 6 May**
 - 8047
- **Cleanup 2: Thurs, 7 May 2009**
 - 8079
 - 8103
 - 8349
- **Sustainability: Thurs, 7 May 2009**
 - 8051



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Questions?



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Backups



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Sustainable Communities

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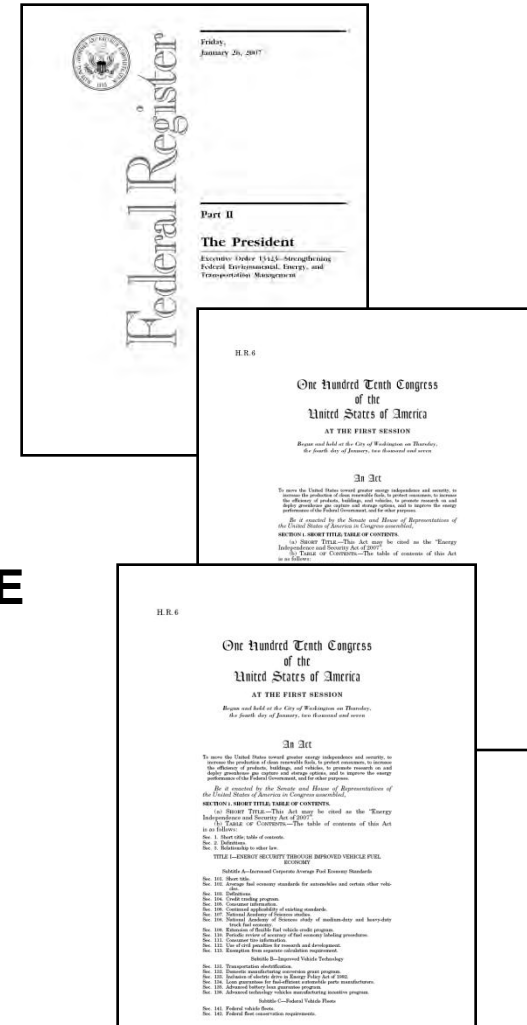
- 75% of the HPSB requirements are installation wide
- Tri-Service Collaborative Group proposes a single streamlined approach
- USGBC, DOE and EPA in advisory roles
- Fence-to-Fence Tri-Service structured rating system
 - LEED-like scorecard
 - 10 categories with requirements & credits under each
 - „Credit Sheets“ identify requirements and how to comply
- Based on Asset Management and EMS
 - Each „credit“ mapped to Activity Management Plan
 - Continuous improvement process



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Challenges

- **Executive Order (EO) 13423**
 - Reduce Energy Consumption 30% by 2015
 - Reduce Water use 20% by 2015
 - Green Procurement
 - Hazardous material and waste reductions
 - 15% High Performance/Sustainable Buildings by 2015
- **Energy Policy Act of 2005 (EPAct05)**
 - Building shall be 30% more efficient than ASHRAE 90.1
 - Use advanced meters
- **Energy Independence and Security Act of 2007 (EISA07)**
 - Buildings reduce fossil fuel consumption
 - 55% by 2010; 100% by 2030
 - Restore predevelopment hydrology





AF LEED Buildings Honor Roll

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Sustainable Design and Development

Leadership in Energy & Environmental Design



Does LEED = *Green*?



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LEED Pitfalls



Charging Station?



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What Makes Sense





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LEED Pitfalls



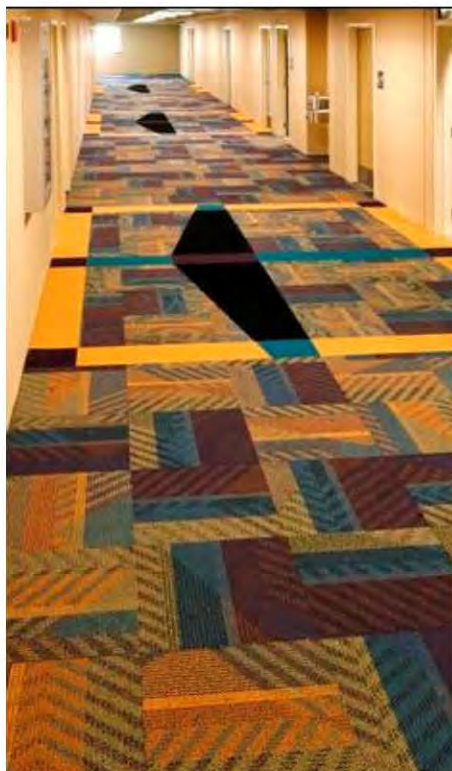
Match material performance with requirements

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Proper Material Selection



IN THIS SECTION

WHAT IS SUSTAINABILITY?

OUR JOURNEY

PROGRESS TO ZERO

SUSTAINABILITY ACTION

COMMUNITY & SOCIAL RESPONSIBILITY

STAKEHOLDERS & IMPACT

NEWS & ARTICLES

INTERACTIVE

10-PRINCIPLES OF SUSTAINABILITY

Toward a More Sustainable Way of Business

Business and industry are developing in a different world from the one we live in today. Formerly, people saw the world as a place of infinite resources. What emerged was a highly industrialized, resource-intensive system that used infinite resources, with little to no thought given to its impact. Today, that system no longer enhances our prosperity; instead, it is endangering it. When it is faced with itself as part of the system and the solution problem, we begin a journey in a different capacity, toward sustainability.

The 10 principles guiding forward sustainability have been a more difficult to integrate into our business and see the world. Since then, these pages have a closer look at how we see a journey that is marked by innovation, as we continue to remain and redesign our way of doing things, adding the final piece, which is the entire business. You will find the 10 principles with accompanying and advice on how to journey and learn how to actually measure our progress. We believe the 10 principles journey can be a model for business in the new industrial revolution.

DESIGN SUSTAINABILITY

MISSION

Achieving Mission Zero™

Mission Zero is a commitment to sustainability that has evolved into the company's 10 Principles of Sustainability. Our purpose is to have any negative impact on the environment by 2028.

A Model, Vision and Measurement as Guides

The 10 Principles model for sustainable business has emerged, marked guides our journey and from the perspective of business can drive innovation and design our own journey. As we go the road to work in a sustainable way, we will be a team, making all a model to realize it, developed the 10 Principles™, and our 10 principles measurements, called *Sustainability™*, to monitor progress and keep us on our journey's path. Learn more about the 10 PRINCIPLES OF SUSTAINABILITY.



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LEED Pitfalls



Essential: Proper design and maintenance
personnel buy-in



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Another Approach





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AF LEED Certified Honor Roll



AF Weather Agency

- LEED Gold
- 41 LEED Points



Keesler Housing

- 736 Homes LEED Silver
- All 1028 EnergyStar Rated
- Largest residential transfer in US



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Air Force Sustainable Policy for New Facilities

- Current policy issued July 07
- Key requirements
 - All MILCON vertical facilities shall be *capable of achieving LEED "Silver"*
 - Incorporates EPA05 and EO 13423 requirements
 - FY09: 5% of total MILCON LEED certified
 - FY10/later: 10% LEED certified
- Policy currently in re-write

ATTACHMENT 1
LEEDSM NC v2.2 Project Checklist

LEED-NC v2.2		
Sustainable Sites	14 Possible Points	Required
SS Credit 1: Construction Activity Pollution Prevention	1	Required
SS Credit 2: Site Selection	1	Required
SS Credit 3: Sustainable Development	1	Required
SS Credit 4: Alternative Transportation: Public Transportation Access	1	Required
SS Credit 5: Alternative Transportation: Bicycle Storage & Changing Room	1	Required
SS Credit 6: Alternative Transportation: Low-Speed & Fuel Efficient	1	Required
SS Credit 7: Alternative Transportation: Parking Capacity	1	Required
SS Credit 8: Site Development: Protect or Restore Habitat	1	Required
SS Credit 9: Site Development: Maximize Open Space	1	Required
SS Credit 10: Stormwater Design: Quantity Control	1	Required
SS Credit 11: Stormwater Design: Quality Control	1	Required
SS Credit 12: Heat Island Effect: Non-Roof	1	Required
SS Credit 13: Heat Island Effect: Roof	1	Required
SS Credit 14: Light Pollution Reduction	1	Required
Water Efficiency	8 Possible Points	Required
WE Credit 1.1: Water Efficient Landscaping: Reduce by 50%	1	Required
WE Credit 1.2: Water Efficient Landscaping: No Potable Water Use	1	Required
WE Credit 2: Innovative Wateruse: Technologies	1	Required
WE Credit 3.1: Water Use Reduction: 30% Reduction	1	Required
WE Credit 3.2: Water Use Reduction: 40% Reduction	1	Required
Energy & Atmosphere	17 Possible Points	Required
EA Credit 1: Fundamentals: Commissioning of the Building Energy Systems	1	Required
EA Credit 2: Minimum Energy Performance	1	Required
EA Credit 3: Enhanced Energy Performance	1	Required
EA Credit 4: On-Site Renewable Energy	1	Required
EA Credit 5: Enhanced Commissioning	1	Required
EA Credit 6: Enhanced Energy Performance	1	Required
EA Credit 7: Measurement & Verification	1	Required
EA Credit 8: Green Power	1	Required
Materials & Resources	12 Possible Points	Required
MR Credit 1: Recycling & Collection of Recyclables	1	Required
MR Credit 2.1: High-Rise Materials: 75% of Existing Walls, Floors, Roof	1	Required
MR Credit 2.2: High-Rise Materials: 75% of Existing Walls, Floors, Roof	1	Required
MR Credit 3.1: High-Rise Materials: 75% of Existing Walls, Floors, Roof	1	Required
MR Credit 3.2: High-Rise Materials: 75% of Existing Walls, Floors, Roof	1	Required
MR Credit 4: Construction Waste Management: Divert 75% from Disposal	1	Required
MR Credit 5: Construction Waste Management: Divert 75% from Disposal	1	Required
MR Credit 6: Materials Waste: 75%	1	Required
MR Credit 7: Materials Waste: 75%	1	Required
MR Credit 8: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 9: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 10: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 11: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 12: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 13: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 14: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 15: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
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MR Credit 99: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required
MR Credit 100: Recycled Content: 20% (post-consumer + pre-consumer)	1	Required



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Sustainability Requirements for Existing Facilities

- **Current Federal requirement are single facility-based**
- **Requires multiple surveys to comply with all installation sustainable requirements**
- **No standard method for reporting**



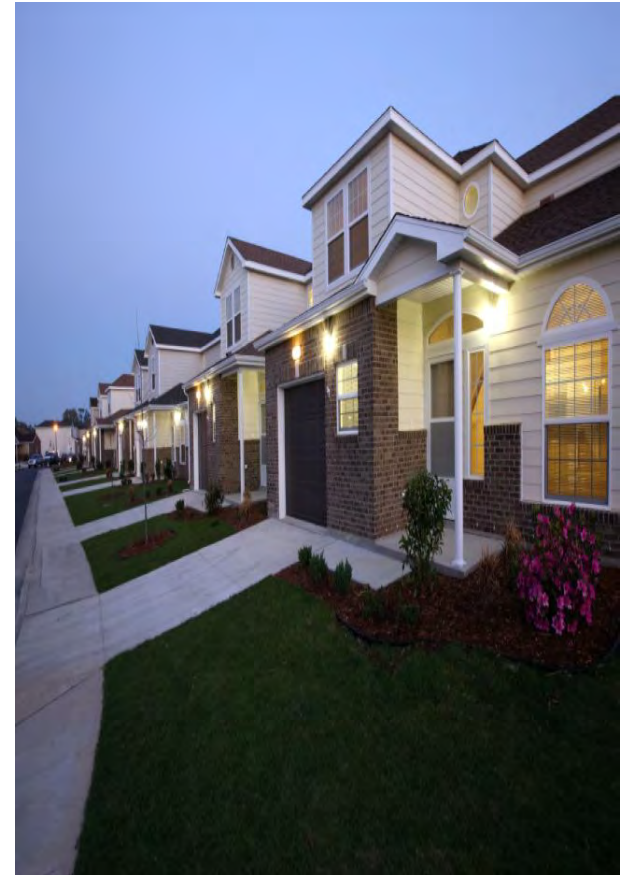
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Option B: Sustainable Communities

- **Tri-Service Collaborate Group proposes a single streamlined approach**
- **USGBC, DOE, and EPA in advisory roles**
- **Holistic sustainable rating system**
 - **Includes energy and water requirements**
 - **Measures/Reports compliance**
 - **Reflects all aspects of the installation**





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Option B: Sustainable Communities

- **Installation-wide rating system**
 - **Reduced data collection**
 - **Streamline reporting requirements**
 - **Enable enterprise acquisition strategies**
 - **Comprehensive & synergistic methodology**
 - **More holistic methodology for sustainability**
 - **Facilitate continuous improvement**
- **Approximately 75% of the HPSB requirements are installation-wide**



Proposed Scorecard Snapshot

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Sustainable Communities Scorecard

Installation Name:

Location:

Yes ? No

				Planning (P)	X Points
				Req 1 EMS Conformance	Required
				Req 2 Environmental Performance Scorecard	Required
				Credit 1 Asset Inventory	
				Credit 2 Long Term Environmental Liability Assessment (Air, Land, Restoration)	
				Credit 3 Sustainable Investment Planning Process	
				Credit 4 Local / Regional Business Support	
				Credit 5 Regional Political Coordination Process (around the fenceline)	
				Credit 6 Land Use	
				Credit 7 Brownfield Development Incentive	
				Credit 8 Circulation / Connection	
				Credit 9 Light & Air	
				Credit 10 Climate Appropriate Design	
				Credit 13 Air Installation Compatible Use Zone Program (AICUZ)	
				Credit 14 Base Comprehensive Planning	
				Credit 15 Development Density	
				Credit 16 On-base Housing and Dormitories	
				Credit 17 Mixed Use Development	
				Credit 18 Facility Utilization and Optimization	

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Proposed Credit Snapshots

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EMS Conformance

P	EG	WE	MW	NI
BI	T	HDP	CE	IR
Requirement 1				

Intent

Compliance – must meet federal requirements listed below.

Requirements

- Federal Requirement:
 - EO13423, (-)
 - DODI xxxx.xx
- Service Requirements
 - Army:
 - Navy:
 - Air Force: AFI XX-XXXX

Submittals Documentation

The submittals will be a list of specific data that should be gathered into a database.

*The intention is that this reference workbook will be used as a scope document for a database designer. The designer will create a database and a web based tool for filling in the information required by the submittals. They do not want yes/no questions and checkmarks. They want for real data to be entered, such as quantities, percentages, etc.

Potential Technologies & Strategies

Not completing this section until after the Tri Service meeting in May

Asset Management Key:		
Army:	Navy:	Air Force: NI

GHG Emissions Benchmark and Tracking

P	EG	WE	MW	NI
BI	T	HDP	CE	IR
Requirement 1				

Intent

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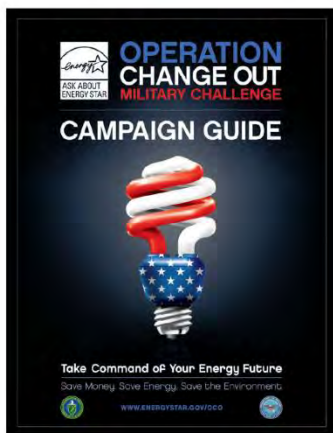
Way Ahead

- **Define credits and requirements**
 - **Reduce data acquisition**
 - **Streamline reporting requirements**
- **Identify a scoring methodology**
- **Develop business strategy**
 - **Tie score to investment strategies**
 - **Prioritize projects considering triple bottom line**
 - **Complements Asset Management approach**



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- **100% participation in EnergyStar “Operation Change Out”**





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Renewable Energy

- **Air Force leads renewable energy initiative**
 - **Largest PV system in N. America**
 - **Nellis AFB**
 - **Purchasing renewable energy**
 - **Rated top federal agency**
 - **Rated #8 nationally – over 426M KWh**
 - **Installations pursuing local renewable resources**
 - **Dyess AFB – 100% wind power**
 - **Fairchild AFB – 100% green power**
 - **Edwards AFB – 60% green power**
 - **Ascension Island – x% wind power**
 - **100% participation in EnergyStar „Operation Change Out“**





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Going “Green”

■ “Green Remediation”

- Focus on working with and leveraging Mother Nature**
- 50% of current remediation systems are “green”**
 - Phytoremediation – utilizing tree root structure to remediate**
 - Bioaugmentation – groundwater stimulation of dechlorination**
 - Wetlands & Biowalls**
 - Solar Powered Systems**

■ Kevin Section